MEMORANDUM

June 29, 1990

TO: H. A. Caves, Chief
Consumer Protection Service

FROM: Paul H. Brown, Director
Radiation Protection Division

SUBJECT: Radiation Survey of Sooner Dial

On April 24, 1990, Gary Ammon and I traveled to Clinton for the purpose of conducting a radiation survey of the building, land, and rubble which was associated with the Sooner Dial Facility. The present land owner, Ron Grubb, was contacted (405-323-6400), and we received his permission to survey the site. We were also assisted by our local sanitarian, Terry Thiesson.

Areas surveyed were the original site, which consists of a vacant lot and auto shop located at 1000-1004 10th Street, the adjacent alley, and surrounding property (see attached map). In addition, building rubble had been removed and transported to a dumping area approximately two (2) miles southeast of the site. This dump area is an isolated field in which fill material had been requested. No further development of this area is now planned.

A radiation survey was performed at all locations utilizing a Ludlum Micro-R Meter. Gamma readings in excess of 50 micro-R per hour (approximately 7 to 8 times background) were noted and those areas delineated on the map. In addition, soil samples were taken for further analysis. Sample numbers and locations are also noted on the accompanying map.

Procedure for Analyzing Soil Samples

The radium-226 in soil samples were analyzed by Mark Kurklin of the radiochemistry laboratory in June 1990. They were first air dried and then crushed to a granular consistency. (They were not ground with a mortar and pestle.) Each sample was mixed well and a 25 gram aliquot of the soil was weighed into a plastic bottle that was used as the configuration for calibration. A known radium-226 standard was prepared using 25 grams of low background soil in the same plastic bottle configuration.

A gamma spectrum of each sample, the standard, and a blank was collected for 30 minutes on a Canberra Series 90 Multichannel Analyzer. The area under the radium-226, 186.1 KeV energy peak was determined using the gamma spectrum analysis computer software provided by Canberra Industries. The radioactivity due to radium-226 in each of the samples was calculated as proportional to the number of counts under the 186.1 KeV energy peak of the known standard. There was no apparent interference from uranium-235 which has a gamma peak at 185.7 KeV.

Regulatory Limits

Section 14, Table 3, Column 2 of the Oklahoma Radiation Protection Regulations indicates a release limit for insoluble Ra-226 in water as 3×10^{-5} microCuries/ml (30 pico Curie/ml). No specific table exists for soil contamination. However, it is an acceptable practice to convert this table to soil contamination limits by substituting the pCi/ml to pCi/gram. Therefore, the soil contamination limit should be 30 pCi/gram. (Further rationale to support this assumption can be obtained from Dale McHard).

The survey results and observations for each locale follow:

Dump Site

Again, this is a very isolated area containing numerous piles of building rubble. Gamma surveys were conducted, and three areas with elevated readings were staked, and soil samples collected. The results follow:

Area	Gamma Reading	Soil Depth	Activity/gram
1	350 Micro R/hr	0 - 6 In	385 pCi
2	250 Micro R/hr	0 - 6 In	18 pCi
3	200 Micro R/hr	0 - 6 In	226 pCi

This area does contain building rubble with residual radium in concentrations of concern. Due to its isolated location, at this time I would not recommend any removal. However, the area must be observed for any future development plans.

Auto Shop

Gamma surveys indicated three areas on the floor with measurable readings. However, these areas had been painted and marked. Swipe tests indicated no removal contamination. I consider the floor to be acceptable and no further remedial action is needed.

Vacant Lot

A building formerly located at the rear of the auto body shop had been removed in late 1984, and the rubble transported to the dump area previously mentioned. There appears to be concrete in areas of the lot 4 - 6 inches below the surface. The following sample locations (noted on the map) and readings are associated with this lot and the adjacent areas:

Sample Location	Gamma Reading	Soil Depth	Activity/Gram
4	1000 Micro R	0 - 6 In	571
5	1000 Micro R	6 - 12 In	1003
6	50 Micro R	0 - 4 In	83
7	50 Micro R	0 - 6 In	71
8	50 Micro R	6 - 12 In	1002
9	50 Micro R	0 - 6 In	176
10	50 Micro R	6 - 12 In	102
11	100 Micro R	0 - 6 In	121
12	100 Micro R	0 - 6 In	31
13	250 Micro R	0 - 6 In	412

Samples 7 and 8 were taken on property, uphill from the site. I would speculate that this area contains fill dirt, which was removed from the original site.

Observations

It is evident from this and previous surveys that there is radium contamination present on the site at levels which may require removal. This information was conveyed to Mr. Grubb, who I visited with as the survey was being completed.

Of particular concern is that the access to the vacant lot is unrestricted. A $75 fence was placed around the lot in 1985, but removed shortly after to allow for mowing.

The fact that there is soil contamination off-site on will also be of concern.

Recommendations

A thorough site characterization study is needed which is beyond our capabilities. This is something that should be requested of Mr. Grubb.

We should rely on Terry Thiesson of the Custer County Health Department to monitor the area and report any changes. We also need to keep him fully informed.

The contamination area located on adjacent property will be of concern. I have no suggestions for its remediation.

Finally, we must begin to reach some agreement within the agency as to what our policies and protocols should be for management and clean-up of this site.

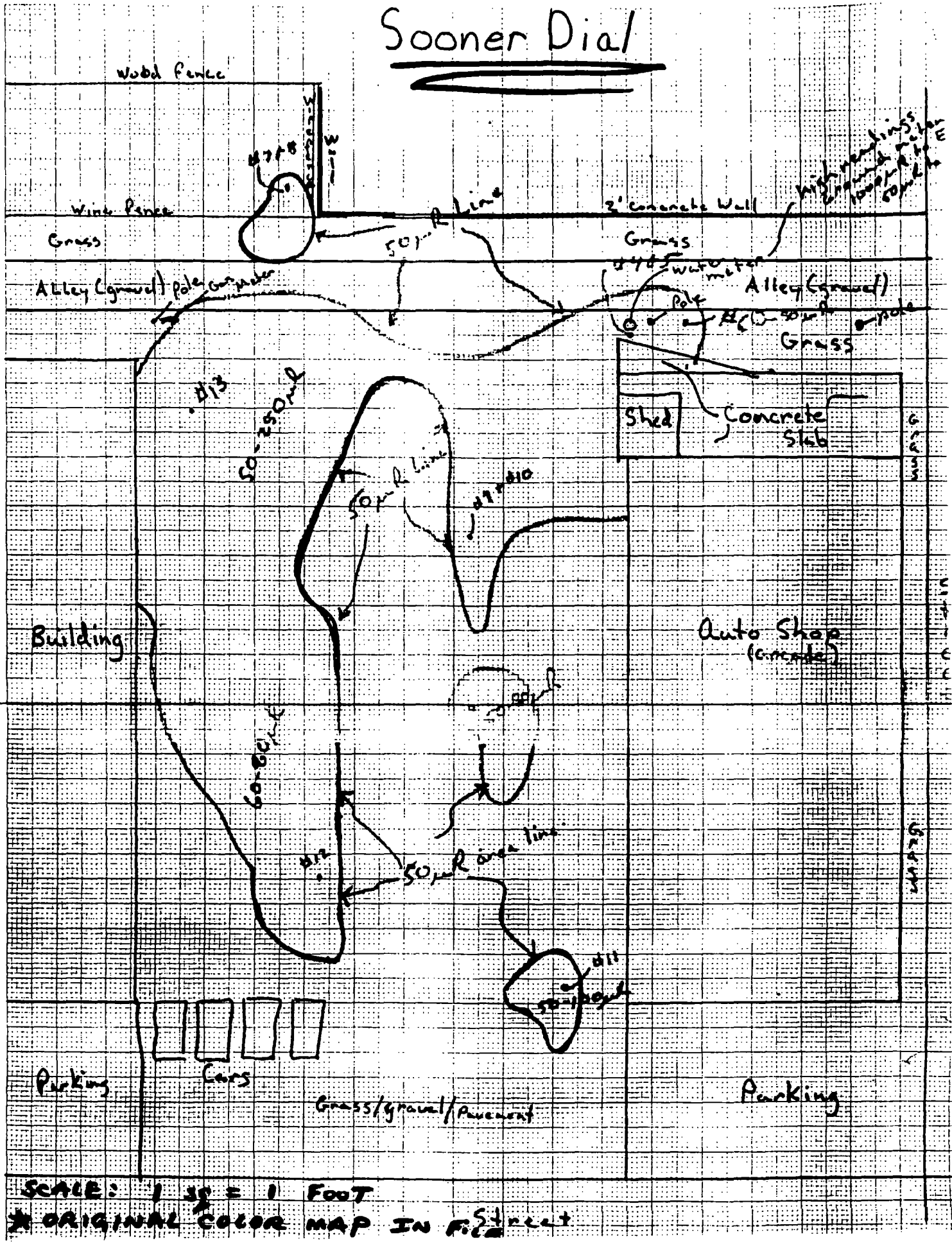
PHB/mj

Attachment 1

cc: Sooner Dial File

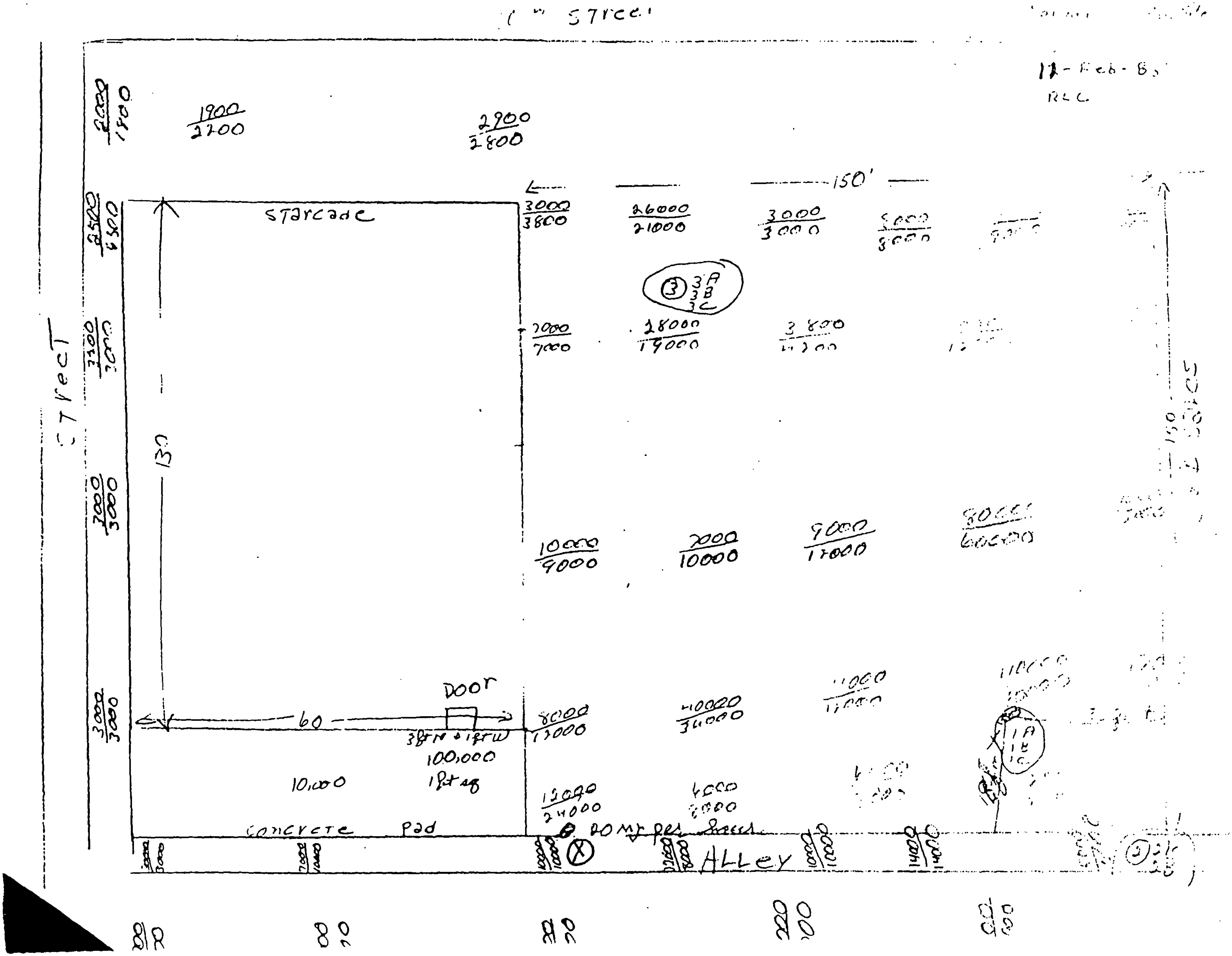
NORTH

Sooner Dial

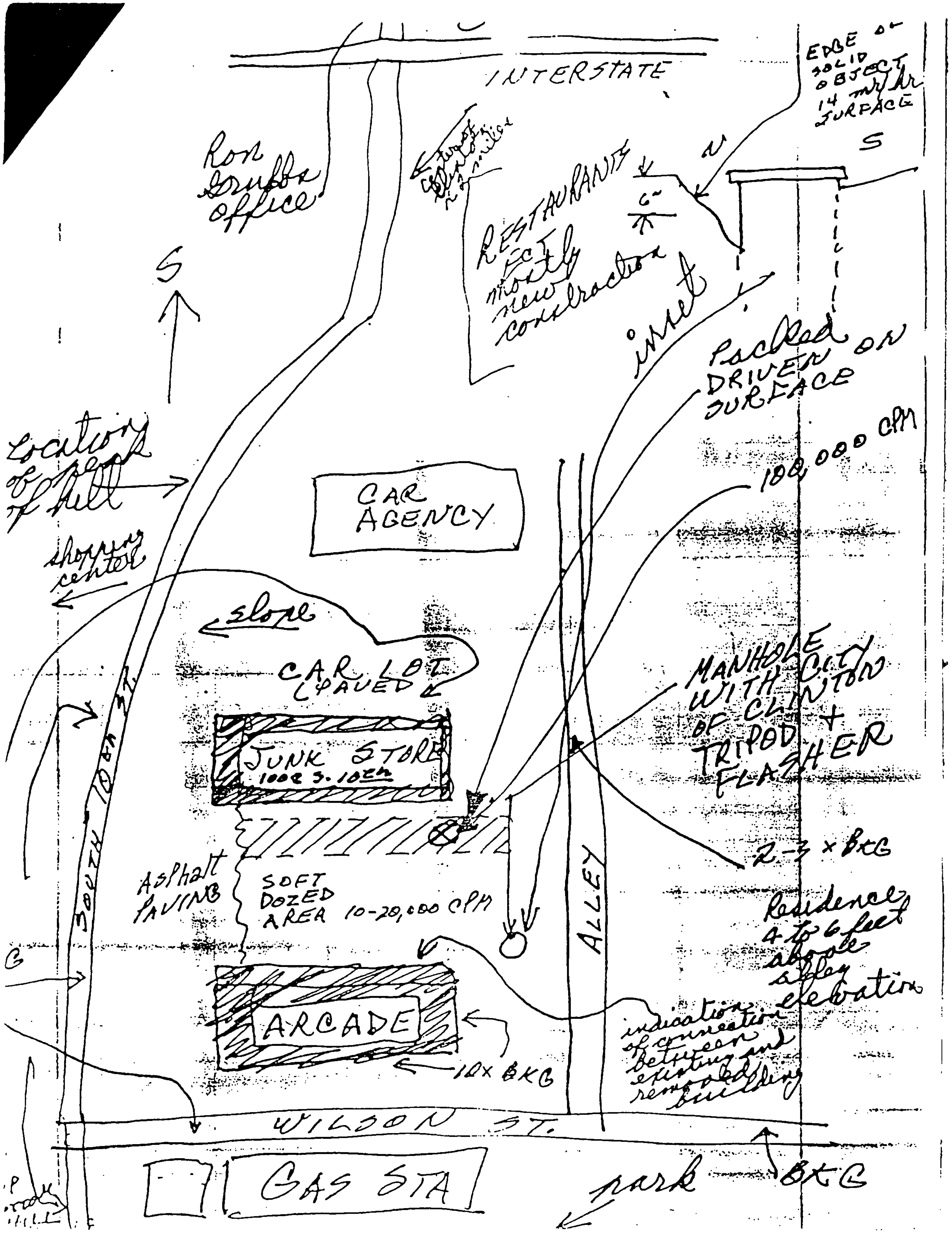


SCALE: 1 sq = 1 FOOT

* ORIGINAL COLOR MAP IN Filestreet



Street
11-Feb-85
RLC
Street
1900 / 2700
2900 / 2800
150'
Starcade
3000 / 3800
26000 / 21000
3000 / 3000
③ 3A 3B 3C
2000 / 7000
18000 / 19000
3800
130
10000 / 9000
7000 / 10000
9000 / 17000
80000 / 60000
Door
60
3ft N + 18ft W
100,000
18ft ag
10,000
8000 / 17000
40000 / 34000
11000 / 17000
12000 / 24000
4000 / 8000
1A 1B 1C
Concrete Pad
20 Mr per Sec
Ⓧ
Alley


INTERSTATE
EDGE OF SOLID OBJECT 14 mr/hr SURFACE
S
N
Ron Grubbs office
RESTAURANTS ECT mostly new construction
6"
inlet
Packed DRIVEN ON SURFACE
100,000 CPM
S
Location of peak of hill
shopping center
CAR AGENCY
slope
CAR LOT (PAVED)
JUNK STORE
1002 S. 10th
MANHOLE WITH CITY OF CLINTON TRIPOD + FLASHER
2-3 x BKG
Asphalt PAVING
SOFT DOZED AREA 10-20,000 CPM
ALLEY
Residence 4 to 6 feet above alley elevation
ARCADE
10x BKG
indication of connection between existing and removed building
SOUTH 10th ST.
WILSON ST.
GAS STA
park
BKG